

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A method to assemble a pre-curved bolster plate to one side of a substrate having a first side and a second side, comprising:

attaching a component to an electrical contact area on said first side of said substrate; ~~and~~

selecting a set of physical dimensions for the pre-curved bolster plate;

attaching said pre-curved bolster plate on said second side of said substrate, wherein said pre-curved bolster plate is attached to said second side opposite said electrical contact area on said first side of said substrate;

wherein the pre-curved bolster plate has a radius of curvature where the radius is pre-calculated by a method comprising:

estimating an initial radius of curvature of the pre-curved bolster plate by use of a hand calculation, based upon a uniform load from a clamping force to be applied on the component that will be attached to the substrate;

modeling the pre-curved bolster plate with the initial radius, by use of a computer aided design software; and

determining a final radius of curvature of the pre-curved bolster plate by use of a finite element analysis software so that the pre-curved bolster plate will deflect

to a flat plate after the clamping force is applied to the component, substrate, and pre-curved bolster plate, wherein the step of determining the final radius of curvature comprises modifying the initial radius into the final radius;

cutting the pre-curved bolster plate according to the selected set of physical dimensions for the pre-curved bolster plate;

forming the final radius in the pre-curved bolster plate by stamping or molding the pre-curved bolster plate;
and

clamping the component to the first side of the substrate and clamping the pre-curved bolster plate to the second side of the substrate, by bolting the pre-curved bolster plate to the substrate and to a clamp coupled to the component so that the final radius on the pre-curved bolster plate is eliminated and the pre-curved bolster plate is deflected into the flat plate that is in complete contact with the substrate.

Claim 2 (original): The method of claim 1, wherein said component is a land grid array (LGA) component.

Claim 3 (original): The method of claim 1, wherein said substrate is selected from a group of substrates consisting of: a printed circuit board (PCB), a multi-chip module (MCM), and a flexible substrate.

Claim 4 (original): The method of claim 1, wherein said pre-curved bolster plate includes a material selected from

the group consisting of: a stainless steel alloy, a powder-coated spring steel alloy, a plated spring steel alloy, a painted spring steel alloy, a titanium steel alloy, a carbon steel alloy, a magnesium alloy, and an aluminum alloy.

Claim 5 (original): The method of claim 1, wherein said pre-curved bolster plate has a spherical curvature.

Claim 6 (original): The method of claim 1, wherein said pre-curved bolster plate has a cylindrical curvature.

Claim 7 (original): The method of claim 1, wherein said pre-curved bolster plate has a radius of curvature in excess of 100 inches (254 centimeters).

Claims 8-12 (previously cancelled)

Claims 13-20 (previously cancelled)

Claim 21 (currently amended): A method for providing support to a substrate, the method comprising:

attaching a component to an electrical contact area on a first side of the substrate; and

selecting a set of physical dimensions for the pre-curved bolster plate;

attaching a pre-curved bolster plate on a second side of the substrate, the pre-curved bolster plate having a pre-calculated radius of curvature prior to attachment to the second side of the substrate;

wherein the pre-calculated radius is pre-calculated by a method comprising:

estimating an initial radius of curvature of the pre-curved bolster plate by use of a hand calculation, based upon a uniform load from a clamping force to be applied on the component that will be attached to the substrate;

modeling the pre-curved bolster plate with the initial radius, by use of a computer aided design software; and

determining a final radius of curvature of the pre-curved bolster plate by use of a finite element analysis software so that the pre-curved bolster plate will deflect to a flat plate after the clamping force is applied to the component, substrate, and pre-curved bolster plate, wherein the step of determining the final radius of curvature comprises modifying the initial radius into the final radius;

selecting a set of physical dimensions for the pre-curved bolster plate;

cutting the pre-curved bolster plate according to the selected set of physical dimensions for the pre-curved bolster plate;

forming the final radius in the pre-curved bolster plate by stamping or molding the pre-curved bolster plate;
and

clamping the component to the first side of the substrate and clamping the pre-curved bolster plate to the second side of the substrate, by bolting the pre-curved bolster plate to the substrate and to a clamp coupled to the component so that that final radius on the pre-curved bolster plate is eliminated and the pre-curved bolster

plate is deflected into the flat plate that is in complete contact with the substrate.

Claim 22 (previously presented): The method of claim 21, wherein the component comprises a land grid array (LGA) component.

Claim 23 (previously presented): The method of claim 21, wherein the substrate is selected from a group of substrates consisting of: a printed circuit board (PCB), a multi-chip module (MCM), and a flexible substrate.

Claim 24 (previously presented): The method of claim 21, wherein the pre-curved bolster plate includes a material selected from a group consisting of: a stainless steel alloy, a powder-coated spring steel alloy, a plated spring steel alloy, a painted spring steel alloy, a titanium steel alloy, a carbon steel alloy, a magnesium alloy, and an aluminum alloy.

Claim 25 (previously presented): The method of claim 21, wherein the pre-curved bolster plate has a spherical curvature.

Claim 26 (previously presented): The method of claim 21, wherein the pre-curved bolster plate has a cylindrical curvature.

Claim 27 (previously presented): The method of claim 21, wherein the pre-curved bolster plate has a radius of

curvature in excess of approximately 100 inches (254 centimeters).

Claim 28 (previously presented): A substrate support assembly produced in accordance with the method of claim 21.

Claims 29-36 (previously cancelled)

Claim 37 (currently amended): A method for coupling a plate member to an electrical packaging assembly, the method comprising:

- providing an electrical packaging assembly;
- providing a plate member that is pre-curved;
- selecting a set of physical dimensions for the plate member;
- cutting the plate member according to the selected set of physical dimensions for the plate member;
- forming an initial radius of curvature in the plate member;
- forming a final radius of curvature in the plate member by stamping or molding the plate member;
- disposing the plate member against the electrical packaging assembly;
- flexing the plate member towards the electrical packaging assembly to produce a flexed plate member; and
- coupling the flexed plate member to the electrical packaging assembly including clamping a component to a first side of a substrate of the electrical packaging assembly and clamping the plate member to a second side of

the substrate, by bolting the plate member to the substrate and to a clamp coupled to the component so that the final radius on the plate member is eliminated and the plate member is deflected into a flat plate that is in complete contact with the substrate;

wherein the plate member is pre-curved with a radius of curvature where the radius is pre-calculated by a method comprising:

estimating ~~an~~ the initial radius of curvature of the plate member by use of a hand calculation, based upon a uniform load from a clamping force to be applied on the electrical packaging assembly;

modeling the plate member with the initial radius, by use of a computer aided design software; and

determining ~~a~~ the final radius of curvature of the plate member by use of a finite element analysis software so that the plate member will deflect to ~~a~~ the flat plate after the clamping force is applied to the electrical packaging assembly and plate member, wherein the step of determining the final radius of curvature comprises modifying the initial radius into the final radius.

Claim 38 (previously presented): The method of Claim 37 wherein said flexing comprises curving opposed ends of the plate member towards a substrate of the electrical packaging assembly.

Claim 39 (previously presented): The method of Claim 37 wherein said flexing comprises curving opposed ends of the plate member towards a substrate of the electrical

packaging assembly until the plate member is generally flushed against the substrate.

Claim 40 (previously presented): The method of Claim 37 wherein said electrical packaging assembly comprises an electrical component having a plurality of leads attached to an electrical contact area of a substrate.

Claim 41 (previously presented): The method of Claim 39 wherein said electrical packaging assembly comprises an electrical component having a plurality of leads attached to an electrical contact area of said substrate.

Claim 42 (previously presented): The method of Claim 37 wherein said plate member is stamped to achieve a spherical curvature.

Claim 43 (previously presented): The method of Claim 41 wherein said plate member is stamped to achieve a cylindrical curvature.

Claim 44 (previously presented): The method of Claim 37, wherein said plate member is fabricated from a material selected from the group of materials consisting of: a stainless steel alloy, a powder-coated spring steel alloy, a plated spring steel alloy, a painted spring steel alloy, a titanium steel alloy, a carbon steel alloy, a magnesium alloy, and an aluminum alloy.

Claim 45 (previously presented): The method of Claim 43, wherein said plate member is fabricated from a material selected from the group of materials consisting of: a stainless steel alloy, a powder-coated spring steel alloy, a plated spring steel alloy, a painted spring steel alloy, a titanium steel alloy, a carbon steel alloy, a magnesium alloy, and an aluminum alloy.

Claim 46 (currently amended): A method for assembling a bolster plate to a circuit member, the method comprising:

providing a circuit member;

selecting a set of physical dimensions for a curved bolster plate;

cutting the curved bolster plate according to the selected set of physical dimensions for the curved bolster plate;

forming an initial radius of curvature in the curved bolster plate;

forming a final radius of curvature in the curved bolster plate by stamping or molding the curved bolster plate;

disposing a the curved bolster plate against the circuit member;

curving the curved bolster plate towards the circuit member to change the curved bolster plate into a flat bolster plate; and

coupling the flat bolster plate to the circuit member including clamping a component to a first side of the circuit member and clamping the curved bolster plate to a second side of the circuit member, by bolting the curved

bolster plate to the circuit member and to a clamp coupled to the component so that the final radius on the curved bolster plate is eliminated and the curved bolster plate is deflected into a flat plate that is in complete contact with the circuit member;

wherein the curved bolster plate has a radius of curvature where the radius is pre-calculated by a method comprising:

estimating ~~an~~ the initial radius of curvature of the curved bolster plate by use of a hand calculation, based upon a uniform load from a clamping force to be applied on the circuit member;

modeling the curved bolster plate with the initial radius, by use of a computer aided design software; and

determining ~~a~~ the final radius of curvature of the curved bolster plate by use of a finite element analysis software so that the curved bolster plate will deflect to ~~a~~ the flat plate after the clamping force is applied to the circuit member and curved bolster plate, wherein the step of determining the final radius of curvature comprises modifying the initial radius into the final radius.

Claim 47 (previously presented): The method of Claim 46 wherein said curving comprises curving opposed ends of the bolster plate towards the circuit member.

Claim 48 (previously presented): The method of Claim 46 wherein said curving comprises curving opposed ends of the bolster plate towards the circuit member until the bolster plate is generally flushed against the circuit member.

Claim 49 (previously presented): The method of Claim 46 wherein said circuit member includes an electrical contact area having a plurality of leads attached thereto.

Claim 50 (previously presented): The method of Claim 48 wherein said circuit member includes an electrical contact area having a plurality of leads attached thereto.

Claim 51 (previously presented): The method of Claim 46 wherein said bolster plate is stamped to achieve a spherical curvature.

Claim 52 (previously presented): The method of Claim 50 wherein said bolster plate is stamped to achieve a cylindrical curvature.

Claim 53 (previously presented): The method of Claim 46, wherein said bolster plate is fabricated from a material selected from the group of materials consisting of: a stainless steel alloy, a powder-coated spring steel alloy, a plated spring steel alloy, a painted spring steel alloy, a titanium steel alloy, a carbon steel alloy, a magnesium alloy, and an aluminum alloy.

Claim 54 (previously presented): The method of Claim 52, wherein said bolster plate is fabricated from a material selected from the group of materials consisting of: a stainless steel alloy, a powder-coated spring steel alloy, a plated spring steel alloy, a painted spring steel alloy,

a titanium steel alloy, a carbon steel alloy, a magnesium alloy, and an aluminum alloy.

Claim 55 (previously presented): An assembly produced in accordance with the method of claim 46.

Claims 56-57 (previously cancelled)

Claim 58 (previously presented): The method of claim 1, wherein the radius of curvature is pre-calculated such that the pre-curved bolster plate deflects into a flat plate after a clamping force is applied to the component which is assembled on the substrate and to the pre-curved bolster plate which is assembled on the substrate.

Claim 59 (previously presented): The method of claim 1, wherein the pre-curved bolster plate has an entire surface that is in contact with the substrate when a clamping force is applied to the pre-curved bolster plate and to the substrate.

Claim 60 (cancelled)

Claim 61 (cancelled)

Claim 62 (cancelled)

Claim 63 (cancelled)

Claim 64 (previously presented): An assembly produced in accordance with the method of claim 1.

Claim 65 (currently amended): The method of claim 21, wherein the radius of curvature is pre-calculated such that the pre-curved bolster plate deflects into a the flat plate after a clamping force is applied to the component which is assembled on the substrate and to the pre-curved bolster plate which is assembled on the substrate.

Claims 66-67 (previously cancelled)

Claim 68 (previously presented): The method of claim 37, wherein the radius of curvature is pre-calculated such that the plate member deflects into the flat plate member after a clamping force is applied to the electrical packaging assembly and to the plate member which is assembled on the electrical packaging assembly.

Claims 69-70 (previously cancelled)

Claim 71 (previously presented): The method of claim 46, wherein the radius of curvature is pre-calculated such that the curved bolster plate deflects into the flat bolster plate after a clamping force is applied to the circuit member and to the curved bolster plate which is assembled on the circuit member.

Claim 72 (previously presented): The method of claim 46, wherein the curved bolster plate has an entire surface that

is in contact with the circuit member when a clamping force is applied to the curved bolster plate and to the circuit member.

Claim 73 (cancelled)

Claim 74 (cancelled)

Claim 75 (cancelled)

Claim 76 (cancelled)

Claim 77 (previously presented): The method of claim 1, further comprising:

if the bolster plate with the final radius will not deflect to a flat plate after the clamping force is applied to the component, substrate, and pre-curved bolster plate, then determining a new radius of curvature for the pre-curved bolster plate;

modeling the pre-curved bolster plate with the new radius, by use of a computer aided design software; and

determining a new final radius of curvature by use of a finite element analysis software so that the pre-curved bolster plate will deflect to a flat plate after the clamping force is applied to the component, substrate, and pre-curved bolster plate, wherein the step of determining the final radius of curvature comprises modifying the new radius to the new final radius.

Claim 78 (previously presented): The method of claim 21, further comprising:

if the bolster plate with the final radius will not deflect to a flat plate after the clamping force is applied to the component, substrate, and pre-curved bolster plate, then determining a new radius of curvature for the pre-curved bolster plate;

modeling the pre-curved bolster plate with the new radius, by use of a computer aided design software; and

determining a new final radius of curvature by use of a finite element analysis software so that the pre-curved bolster plate will deflect to a flat plate after the clamping force is applied to the component, substrate, and pre-curved bolster plate, wherein the step of determining the final radius of curvature comprises modifying the new radius to the new final radius.

Claim 79 (previously presented): The method of claim 37, further comprising:

if the plate member with the final radius will not deflect to a flat plate after the clamping force is applied to the electrical packaging assembly and plate member, then determining a new radius of curvature for the plate member;

modeling the plate member with the new radius, by use of a computer aided design software; and

determining a new final radius of curvature by use of a finite element analysis software so that the plate member will deflect to a flat plate after the clamping force is applied to the electrical packaging assembly and plate member, wherein the step of determining the final radius of

curvature comprises modifying the new radius to the new final radius.

Claim 80 (previously presented): The method of claim 46, further comprising:

if the curved bolster plate with the final radius will not deflect to a flat plate after the clamping force is applied to the circuit member and curved bolster plate, then determining a new radius of curvature for the curved bolster plate;

modeling the curved bolster plate with the new radius, by use of a computer aided design software; and

determining a new final radius of curvature by use of a finite element analysis software so that the curved bolster plate will deflect to a flat plate after the clamping force is applied to the circuit member and curved bolster plate, wherein the step of determining the final radius of curvature comprises modifying the new radius to the new final radius.